

# PATENT COOPERATION TREATY

TRANSLATION

From the  
INTERNATIONAL SEARCHING AUTHORITY

## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing  
(day/month/year)

Applicant's or agent's file reference

**ITR04003**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/JP2005/000172**

International filing date (day/month/year)

**11.01.2005**

Priority date (day/month/year)

**08.01.2004**

International Patent Classification (IPC) or both national classification and IPC

Applicant

**ITO, Kohzo**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

Authorized officer

Facsimile No.

Telephone No.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2005/000172

Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.  
☐ This opinion has been established on the basis of a translation from the original language into the following language  
\_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
  - a. type of material  
☐ a sequence listing  
☐ table(s) related to the sequence listing
  - b. format of material  
☐ in written format  
☐ in computer readable form
  - c. time of filing/furnishing  
☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-37</u>	YES
	Claims _____	NO
Inventive step (IS)	Claims <u>1-37</u>	YES
	Claims _____	NO
Industrial applicability (IA)	Claims <u>1-37</u>	YES
	Claims _____	NO

2. Citations and explanations:

Claims 1-37 appear to be novel and to involve an inventive step.

Document 1: WO 2002/002159 A1 (Kabushiki Kaisha Japan Tissue Engineering), 10 January 2002, Claims; page 11, line 12 to page 14, line 4; Fig. 2

Document 2: Takahiro Ichi et al., "Polyrotaxanes o Kihon Kokkaku toshita 3 Jigen Soshikitai no Chosei to sono Tokusei Kaiseki", The Japan Society of Mechanical Engineers Dai 12 Kai Bio Engineering Koenkai-Shinseiki ni Okeru Bio Engineering no Yakuwari o Kangaeru - Koen Ronbunshu, 05 January 2000, pages 217-218

Document 3: WO 2001/083566 A1 (Center for Advanced Science and Technology Incubation (CASTI)), 08 November 2001, claims; page 19, lines 16-21

Document 4: JP 10-306104 A (President of Japan Advanced Institute of Science and Technology, Hokuriku), 17 November 1998, claims; Par. No. 0017

Document 5: JP 09-301893 A (Japan Science and Technology Corp.), 25 November 1997, claims; Par. No. 0012, 0015-0019, Figs. 1, 3, 4

Documents 1 and 2 disclose a material comprising a polyrotaxane hydrogel crosslinked with a polyrotaxane, and disclose substituting the hydroxyl groups on the cyclodextrin molecules of the polyrotaxane with N, N'-carbonyldiimidazole groups, in other words substituting with non-ionic groups, before crosslinking the polyrotaxane.

Document 3 discloses a compound having a crosslinked polyrotaxane, and that it is desirable to have thiol groups etc., in other words non-ionic groups, as reactive groups on the outside of the cyclodextrin molecules in the polyrotaxane.

Document 4 discloses a platelet metabolism-inhibiting blood-compatible material constituted by hydrophilic linear polymers penetrating the cavities of multiple cyclic compounds and having supramolecular structures with sufficiently bulky biodegradable groups at both ends of these hydrophilic linear polymers in order to prevent the detachment of these hydrophilic linear polymers from these cyclic compounds, and also discloses that this cyclodextrin is hydroxypropylized.

Document 5 (Par. No. 0016, Fig. 3, Fig. 4) discloses that because polyrotaxanes have a molecular state wherein cyclodextrins agglomerate at low temperatures and separate when the temperature rises, they exhibit a stimulus response whereby they are either soluble or insoluble in aqueous suspensions.

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

Claim 35 specifies a crosslinked polyrotaxane, but because the invention specified in claims 22-34, which are cited in claim 35, is a "material", such a disclosure lacks consistency and is unclear.

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box V

Documents 1-5 do not stipulate bridging two polyrotaxane molecules by a physical link.

Therefore, the inventions of claims 1-37 are identical to the inventions disclosed in documents 1-5.

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